**What is claimed is:**

1. A chemical mixing system for making a slurry having a desired solids content within a qualification range, said chemical mixing system comprising:

(a) a mix volume suitable for preparing the slurry from at least first and second chemical components, wherein at least one of the chemical components comprises a plurality of solid particles, and wherein the mix volume is adapted to receive the chemical components from at least first and second component sources, respectively;

(b) a control system responsive to information comprising a measured conductivity value of the slurry, wherein said control system generates a control signal to control the addition of at least one of the chemical components to the mix volume when a slurry is prepared so that the addition of the at least one chemical component can be ceased when the slurry has a measured conductivity value corresponding to the reference conductivity; and

(c) at least one valve disposed in the chemical mixing system at a position effective to regulate the amount of the at least one chemical component added to the mix volume, wherein the at least one control valve is actuated in response to information comprising the valve control signal generated by the control system.

2. The chemical mixing system of claim 1, wherein the control system further comprises at least one sensor at a position effective to generate a sensor signal when a desired amount of at least one of the chemical components is added to the mix volume, and wherein the control system generates the control signal in response to information comprising both the measured conductivity and the sensor signal in order to generate a control signal in response to said sensor signal.

3. The chemical mixing system of claim 2, wherein the control system comprises:

(a) a first sensor at a position effective to detect when a defined amount of one of the chemical components is added to the mix volume;

(b) a conductivity probe at a position effective to detect when a combined amount of the chemical components has the desired solids content.

4. The chemical mixing system of claim 1, wherein at least a portion of an internal surface of the mix volume comprises a corrosion resistant material selected from the group consisting of an ultra high molecular weight polyethylene, a fluorinated polymer, and polypropylene.

5. The chemical mixing system of claim 4, wherein the corrosion resistant material is a fluorinated polymer selected from the group consisting of a perfluoralkoxy polymer, polytetrafluoroethylene, fluorinated ethylene propylene, polyvinylidene fluoride, ethylene tetrafluoroethylene, and chlorotrifluoroethylene.

6. The chemical mixing system of claim 3, wherein the mix volume comprises a mix vessel.

7. The chemical mixing system of claim 6, wherein the mix volume further comprises a recirculation loop.

8. The chemical mixing system of claim 6, wherein the first sensor is located at the mix vessel.

9. The chemical mixing system of claim 7, wherein the first sensor is located at the recirculation loop.

10. The chemical mixing system of claim 29, wherein the conductivity probe is located at the mix vessel.

11. The chemical mixing system of claim 10, wherein the conductivity probe is located at the recirculation loop.

12. The chemical mixing system of claim 1, further comprising a plurality of pressure vacuum vessels operationally coupled to the chemical mixing system to motivate the chemical components through the system.

13. The chemical mixing system of claim 1, further comprising a discharge line for transmitting the slurry from the mix volume to a point of use.